# MEDICAL POLICY

| POLICY TITLE | LUNG VOLUME REDUCTION SURGERY FOR SEVERE EMPHYSEMA |
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| POLICY NUMBER | MP-1.025 |

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| Original Issue Date (Created): | **7/1/2002** |
| Most Recent Review Date (Revised): | **6/11/2018** |
| **Effective Date:** | **8/1/2018** |



## I. POLICY

Lung volume reduction surgery as a treatment for emphysema may be considered **medically necessary** in patients with emphysema who meet ALL of the following criteria*:

- Predominantly upper lobe emphysema with hyperinflation and heterogeneity (i.e., target areas for removal)
- Forced expiratory volume in one second (FEV-1):
    - For patients who are younger than 70 years of age, the FEV-1 must be no more than 45% of the predicted value.
    - For patients who are 70 years of age or older, the FEV-1 must be no more than 45% of the predicted value and greater than or equal to 15% of the predicted value.
- Marked restriction in activities of daily living despite maximal medical therapy
- Age younger than 75 years
- Acceptable nutrition status; i.e., 70–130% of ideal body weight
- Ability to participate in a vigorous pulmonary rehabilitation program
- No coexisting major medical problems that would significantly increase operative risk
- Willingness to undertake risk of morbidity and mortality associated with LVRS
- Abstinence from cigarette smoking for at least 4 months.

Lung volume reduction surgery is considered **investigational** in all other patients, as there is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

*Patient selection criteria are based on the National Emphysema Treatment Trial (NETT)

**Policy Guidelines**

The following additional criteria, also from the NETT trial, may further refine selection of a patient who is a candidate for lung volume reduction surgery:

- Arterial partial pressure of oxygen on room air greater than or equal to 45 mm Hg (≥ 30 mm Hg at elevations of ≥5,000 feet (1524 meters)
- Arterial partial pressure of carbon dioxide on room air less than or equal to 60 mm Hg (≤ 55 mm Hg at elevations of ≥5,000 feet (1524 meters)
- Postrehabilitation 6-minute walk of at least 140 meters, and able to complete 3 minutes unloaded pedaling in exercise tolerance test.

***Cross-References:***
**MP-1.122** Bronchial Valves
**MP-8.008** Outpatient Pulmonary Rehabilitation

## II. PRODUCT VARIATIONS

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This policy is applicable to all programs and products administered by Capital BlueCross unless otherwise indicated below.

**FEP PPO**- Refer to FEP Medical Policy Manual MP-7.01.78, Lung Volume Reduction Surgery for Severe Emphysema. The FEP Medical Policy Manual can be found at: https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies

## III. DESCRIPTION/BACKGROUND

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### EMPHYSEMA

Emphysema is an anatomically defined condition characterized by destruction and enlargement of lung alveoli. It is one of the conditions considered as a chronic obstructive pulmonary disease along with chronic bronchitis and small airways disease. The pathogenesis of emphysema is primarily related to cigarette smoking leading to inflammation and recruitment of immune cells to the terminal air spaces of the lung. The resultant extracellular matrix proteolysis damages the lung. Destruction of the gas exchanging air spaces and ineffective

repair of the extracellular matrix results in airspace enlargement. Emphysema can be characterized into distinct pathologic subtypes. Centriacinar emphysema is most frequently associated with cigarette smoking, is usually most prominent in the upper lobes and superior segments of the lower lobes, and is focal. Panacinar emphysema is characterized by abnormally large air spaces evenly distributed across acini in the lower lobes. It is associated with α1-antitrypsin deficiency. Key pulmonary function parameters are the volume of the first forced expiratory volume in 1 second and the total volume of air exhaled during the spirometry (forced vital capacity ). Airflow obstruction related to chronic obstructive pulmonary disease is characterized by the reduced ratio of forced expiratory volume in 1 second/forced vital capacity and reduction in forced expiratory volume in 1 second correlates with long-term mortality risk.1

### Lung Volume Reduction Surgery

Lung volume reduction is a surgical treatment for patients with severe emphysema. The procedure involves the excision of peripheral emphysematous lung tissue, generally from both upper lobes.

The mechanism of clinical improvement for patients undergoing lung reduction surgery has not been firmly established. However, it is believed that mechanical factors such as elastic recoil and diaphragmatic function are improved by reducing the volume of the hyperinflated diseased lung. In addition to changes in the chest wall and respiratory mechanics, the surgery is purported to correct ventilation-perfusion mismatch and improve right ventricular filling.

Complications from the surgical procedure include death, reintubation, arrhythmias, mechanical ventilation for more than two days, pneumonia, wound infection, and persistent air leak.

Research on lung volume reduction surgery has focused on defining the subgroup of patients most likely to benefit from the procedure. Potential benefits of the procedure (e.g., improvement in functional capacity and quality of life) must be weighed against the potential risk of the procedure (e.g., the risk of postoperative mortality).

### REGULATORY STATUS

Lung volume reduction surgery is a surgical procedure and, as such, is not subject to regulation by the U.S. Food and Drug Administration.

## IV. RATIONALE

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### SUMMARY OF EVIDENCE

For individuals who have upper-lobe emphysema who receive LVRS, the evidence includes randomized controlled trials (RCTs) and systematic reviews of the trials. Relevant outcomes are overall survival, symptoms, functional outcomes, quality of life, and treatment-related mortality. Findings from the National Emphysema Treatment Trial (NETT), a multicenter RCT, have suggested that LVRS is effective at reducing mortality and improving quality of life in select patients with severe emphysema. In subgroup analysis, LVRS offered a survival advantage only to patients not considered at high-risk who had predominately upper-lobe emphysema and low initial exercise capacity. Patients with upper-lobe emphysema, regardless of initial exercise capacity, experienced significant improvement in exercise capacity and quality of life after LVRS. Other, smaller RCTs have generally had similar findings, though they have tended to be underpowered for some outcomes and did not stratify by the distribution of emphysema. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have non-upper-lobe emphysema who receive LVRS, the evidence includes subgroup analysis of a large RCT. Relevant outcomes are overall survival, symptoms, functional outcomes, quality of life, and treatment-related mortality. In the subgroup analysis of NETT, LVRS offered a survival advantage only to patients who had predominately upper-lobe emphysema. For the subgroup with predominately non-upper-lobe emphysema, NETT did not find significant mortality advantages or symptom improvement with LVRS. Although NETT had positive findings for the study population as a whole, given the surgical risks, additional data are needed to confirm the net health outcome in patients with non-upper-lobe emphysema. The evidence is insufficient to determine the effects of the technology on health outcomes.

## V. DEFINITIONS

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**PALLIATIVE** means relieving or alleviating without curing**.**

## VI. BENEFIT VARIATIONS

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The existence of this medical policy does not mean that this service is a covered benefit under the member's contract. Benefit determinations should be based in all cases on the applicable contract language. Medical policies do not constitute a description of benefits. A member's individual or group customer benefits govern which services are covered, which are excluded, and which are subject to benefit limits and which require preauthorization. Members and providers should consult the member's benefit information or contact Capital BlueCross for benefit information.

## VII. DISCLAIMER

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*Capital BlueCross medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. Capital BlueCross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.*

## VIII. CODING INFORMATION

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**Note:** This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

**Covered when medically necessary:**

| CPT Codes® | | | | | | | | |
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| 32491 | 32672 | | | | | | | |



| HCPCS Codes | Description |
|---|---|
| G0302 | Preoperative pulmonary surgery services for preparation for LVRS, complete course of services, to include a minimum of 16 days of services |
| G0303 | Preoperative pulmonary surgery services for preparation for LVRS, 10 to 15 days of services |
| G0304 | Preoperative pulmonary surgery services for preparation for LVRS, 1 to 9 days of services |
| G0305 | Postdischarge pulmonary surgery services after LVRS, minimum of 6 days of services |

| ICD-10-CM Diagnosis Codes | Description |
|---|---|
| J43.0 | Unilateral pulmonary emphysema [MacLeod's syndrome] |
| J43.1 | Panlobular emphysema |
| J43.2 | Centrilobular emphysema |
| J43.8 | Other emphysema |

## IX. REFERENCES

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16. *Blue Cross Blue Shield Association Medical Policy Reference Manual. 7.01.71, Lung Volume Reduction Surgery for Severe Emphysema. June, 2018.*

## X. POLICY HISTORY

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|---|---|
| **MP 1.025** | **CAC 3/30/04** |
| | **CAC 5/25/04** |
| | **CAC 10/26/04** |
| | **CAC 10/25/05** |
| | **CAC 11/28/06** |
| | **CAC 11/27/07** |
| | **CAC 7/28/09** |
| | **CAC 11/30/10** Consensus review. |
| | **CAC 4/26/11** Adopted BCBSA policy and "medically necessary" criteria for lung volume reduction surgery. Information regarding Thoracoscopic laser ablation of emphysematous bullae was removed from this policy as BCBSA has archived their policy on this procedure and research indicates it is rarely performed due to significant morbidity and mortality. Policy criteria regarding endobronchial valves were removed from this policy and created in a separate policy. |
| | **CAC 11/22/11** Minor Revision. Forced expiratory volume (FEV-1) criteria in medically necessary statement changed to less than 45% predicted for patients age 70 or younger and greater than 15% predicted for patients over age 70. |
| | **04/08/13** Admin code review |
| | **7/19/13** Admin code review complete |

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| | **CAC 9/24/13** Consensus review. References updated but no changes to the policy statements. Policy guidelines and rationale added. FEP variation added to refer to the FEP medical policy manual. |
| | **CAC 7/22/14** Consensus review. No changes to the policy statements. References and rationale updated. |
| | **CAC 7/21/15** Consensus review. No change to policy statements. References and rationale updated. Codes reviewed. |
| | **CAC 7/26/16** Consensus review. No changes to the policy statements. Regulatory Status section added. Rationale and Reference sections updated. Coding reviewed. |
| | **Admin update 1/1/17:** Product variation section reformatted. |
| | **CAC 9/26/17** Consensus review. No changes to the policy statements. Background, rationale and references updated**.** Coding reviewed. |
| | **1/1/18 Admin Update:** Medicare variations removed from Commercial Policies. |
| | **6/11/18** Consensus review. No changes to the policy statements. Background, guidelines and references updated. Rationale revised. |

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